

Application No. 10/646,142  
Attorney Docket No. 2003B085

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

#### Listing of Claims:

1-23. (cancelled)

24. (New) A process for selectively removing isobutene and butadiene from an olefinic stream further comprising linear butenes, the process comprising:
- (a) contacting the olefinic stream under hydrogenation conditions with a hydrogenation catalyst to selectively hydrogenate butadiene in the olefinic stream to butenes, butanes, or C<sub>5</sub>+ oligomers, and thereafter
  - (b) contacting the olefinic stream under oligomerization conditions with an oligomerization catalyst to selectively oligomerize isobutene in the olefinic stream to butene oligomers which are dimers or trimers; and thereafter
  - (c) sending said olefinic stream to a C<sub>4</sub> recovery section wherein oligomers formed in Steps (a) and (b) are separated from said olefinic stream.
25. (New) The process of Claim 24, wherein said hydrogenation catalyst includes at least one metal selected from Groups 8, 9, 10 and 11 of the Periodic Table of Elements, preferably wherein said at least one metal is selected from nickel, palladium, platinum, rhodium, ruthenium and mixtures thereof.
26. (New) The process of Claim 24, wherein said hydrogenation catalyst also includes a porous inorganic oxide support, preferably wherein said porous inorganic oxide support is selected from silica, alumina, zirconia, titania, an aluminophosphate, a clay and a crystalline molecular sieve.

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27. (New) The process of Claim 24, wherein said oligomerization catalyst includes a solid acid catalyst, preferably wherein said solid acid catalyst is selected from crystalline molecular sieves, substituted silicates, structured polyacids, acidified resins, mixed metal oxides and sulfated zirconia.
28. (New) The process of Claim 24, wherein the hydrogenation catalyst is contained in a first catalyst bed and the oligomerization catalyst is contained in a second catalyst bed downstream of the first preferably wherein the hydrogenation catalyst and the catalyst bed, oligomerization catalyst are contained in a single reactor.
29. (New) The process of Claim 24, wherein in the recovery section unconverted linear butenes are recovered.
30. (New) The process of Claim 24, wherein said hydrogenation conditions include a temperature of from about 20°C to about 180°C, a pressure of about 0 to about 500 psig (100 to 3550 kPaa), a liquid hourly space velocity of about 0.1 to about 50 hr<sup>-1</sup> and a hydrogen to butadiene molar ratio of about 1 to about 10.
31. (New) The process of Claim 24, wherein said oligomerization conditions include a temperature of about 20°C to about 180°C, a pressure of about 0 to about 500 psig (100 to 3550 kPaa) and a liquid hourly space velocity of about 0.1 to about 50 hr<sup>-1</sup>.
32. (New) The process of Claim 27, wherein said crystalline molecular sieve is selected from faujasites, ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-34, ZSM-35, ZSM-48, ZSM-50, ZSM-57, mordenite and zeolite beta.